THE OUTBREAK OF BOTULINUS POISONING IN SOLON, OHIO*

EMERY R. HAYHURST, M.D., PhD., Fellow A.P.H.A.
Ohio State University and State Department of Health, Columbus, Ohio.

THREE PERSONS of Solon, Cuyahoga County, Ohio, a mother aged 43, a son aged 22, and a daughter aged 15, ate of the contents of a just-previously-opened can of sardines in tomato sauce on June 15, 1925. The can had been purchased 2 days previously at a chain grocery store in a nearby town. Its contents were not cooked or heated before serving. The daughter developed symptoms of botulinus poisoning within about 36 hours and died of the same in approximately 100 hours. The mother developed similar symptoms within about 42 hours and died of the same 17 days later. The son, who barely sampled the contents of the can in question, developed no symptoms. The uneaten portion was fed to the family dog which apparently vomited it but showed no ill consequences.

The can in question was reported to have been swelled, when opened to have spurted over the immediate surroundings including the dress of the daughter who opened it, to have had a "rotten" odor and, at least to the son, a disagreeable taste. A double portion was eaten by the daughter, including most of the liquid part and 1 portion by the mother. The can itself was first discarded and then recovered from the garbage pile by members of the family 3 or 4 days after the date of the meal in question.

Dried scrapings from the recovered can, obtained on July 10, 1925, 25 days after it had been opened, emptied and discarded, amounted to two-thirds of a teaspoonful. Bacteriological examinations of these scrapings were reported positive for botulinus toxin by 3 different laboratories, *viz.*, Professor E. O. Jordan, University of Chicago, Professor W. A. Starin and Fred Berry, Columbus, Ohio, and the Microbiological Laboratory of the U. S. Bureau of Chemistry through the Cincinnati Station. The first 2 of these laboratories also identified the toxin as *type A. botulinus.*†

SYMPTOMS OF POISONING

The symptoms and signs suffered by the victims were quite typical of botulinus poisoning, *i.e.*, gradual development of motor paralysis of certain cranial nerves (3rd, 6th, 7th, laryngeal branch of the 10th, the 11th and the 12th—evidenced first by disturbance in vision, followed with slight nausea, a little vomiting in the first victim, obstinate constipation, inability to swallow, impairment of speech, etc.), with accompanying marked general weakness and anxiety, but without noteworthy gastro-intestinal, respiratory, circulatory or other manifestations. The victims suffered no chills, fever, particular sleep disturbances, pain, headache, impaired consciousness nor urinary disturbances. The reflexes of both upper and lower extremities were gone. No autopsies were held.

It may be considered rather remarkable in this outbreak that a third person who sampled a serving from the can in

* Summary of the official report to the State Department of Health.

† Report of completion of typing had not been received from the third laboratory at the time of the writing hereof, September 21, 1925.

question and actually swallowed 2 small bits, developed no symptoms of poisoning. He, however, claims that he ate only bits of solid portions of the sardine meat, refusing to eat more because he feared spoilage and in all probability he thus avoided ingesting any of the toxin whose distribution was probably confined to the more liquid portions of the contents of the can.

Other cans from the same dozen obtained at the grocery store where the spoiled can was purchased were noticeably bulged on one side, enough to classify them, undoubtedly, as "flippers" or "springers." One of these examined in Chicago by Professor Jordan proved sterile; another examined in Columbus by Starin and Berry also proved sterile; a third which was delivered to the local sanitary officer for analysis by the Cuyahoga County Health Laboratory had not been reported at the time of this writing.

Reports from the U. S. Bureau of Chemistry which examined some 200 "flippers" or "springers" from the same pack, state that the same were sterile, but the bureau also found that 4 out of 9 cans which were actual "swells" contained botulinus poison.

BOTULINUS TOXIN IN SWELLED CANS

From the above, therefore, the outbreak of botulism in question—fortunately for the public, limited to 2 persons only *—may be considered as having all of the desired evidence present to establish scientifically the exact nature and immediate source of intoxication, *viz.*, the usual evidence of spoilage, serving without previous heating, the typical clinical history and symptomatology (perhaps somewhat modified in that 1 person who "sampled" a portion escaped), the agreement in widely separated laboratories as to the specific bacteriological findings in a recovered remnant, including even typing, and the fact that other swelled cans from the same pack were also found to contain botulinus toxin. Whether the ultimate source of these soil organisms in this fish pack was from the tomatoes used, and what possible slip occurred in packing, is not brought out in this investigation.

OFFICIAL ACTION TAKEN FOLLOWING INVESTIGATION

Upon request of the U. S. Department of Agriculture, we are informed that the Cleveland Health Department under the direction of Dr. H. J. Knapp placed an embargo on all remaining stock of the sardine pack in question in that vicinity on July 11, 1925, and the U. S. District Attorney seized the same on August 15, 1925. Likewise, the U. S. Dept. of Agriculture took steps to segregate the balance of the pack elsewhere.

The Ohio State Department of Health, up to the date of reporting hereof, February 3, 1926, has received no notice of other cases of botulism poisoning from any source during the current year either in the vicinity of Solon, Ohio, or elsewhere in the state. It is thought that danger of further outbreak from this particular pack is now over, following the steps which have been taken. Nevertheless, dealers, purchasers, and food handlers should be constantly on the lookout, as always, for "flippers" and "swells" in canned goods of every description and promptly destroy them.

The U. S. Bureau of Chemistry took a stand against canned goods which are without vacuum, or overfilled, or those known as "flippers" or "springers" and which, therefore, confuse retail dealers and purchasers as to whether or not they are spoiled. Such a stand is obviously rational and necessary for public safety.

Although begun critically late, the investigation illustrates how coöperative action on the part of all concerned resulted in precluding further fatalities, as

* Since writing the above Dr. Charles Thom, U. S. Microbiological Laboratory, has informed me in a personal conference that 2 other fatal cases due to eating sardines of the same pack were brought to his attention in California.

well as in the most economic solution to be expected of what might otherwise have been a widely disseminated and protracted outbreak of a singularly fatal form of food poisoning. Here the vigilance is to be commended of the National Canners' Association in learning of the situation and starting the investigation; of the local health department in assisting the same; of the U. S. Bureau of Chemistry and the Cleveland Health Department in taking effective steps to limit further outbreaks; of the public press in constructively handling the news so as to warn the public against spoiled canned sardines, but in such a way as not to ruin a national industry otherwise not implicated; of the grocery company concerned in promptly facilitating evidence and recalling suspected stock; and the frankness of the afflicted family including the *partes principes* in supplying the details essential to establishing causal relations.

[Acknowledgment is especially due Professor Edwin O. Jordan, of the University of Chicago, who advised upon the proper procedures and whose laboratory was also the first to report positive findings from the scrapings secured; Frank Gorrell, Secretary of the National Canners Association, for his promptness in providing whatever information came to his office; Dr. Daniel J. Kindel, Chief of the Division of Industrial Hygiene, and Fred Berry, Chief of Laboratories, Ohio State Department of Health; Professor W. A. Starin, Ohio State University; Harry D. Garrett and Dr. Charles Thom, U. S. Bureau of Chemistry; and A. S. MacLaren, local sanitary officer under Dr. Robert Lockhart, Cuyahoga County Commissioner of Health, Cleveland, Ohio, for their various coöperations and valuable services in the investigation reported herewith. In addition, the valuable observations made by the family physician, Dr. Edwin F. Wakefield, Chagrin Falls, Ohio, and by Dr. John S. Phillips, Cleveland Clinic, Cleveland, Ohio, who was called as consultant the day prior to the death of the mother, and who furnished the record concerning the specific nerve involvements, were indispensable in arriving at the findings obtained in this investigation.]

THE HEALTH EXAMINATION OF THE PRESCHOOL CHILD*

BORDEN S. VEEDER, M.D.

Professor of Clinical Pediatrics, Washington University School of Medicine, St. Louis, Mo.

THERE is no unanimity of definition of the term, the preschool child. While it is usually used as referring to the child of the age-period between infancy and the time of entering school, this has been construed as beginning with either the end of the first or second year of life and ending with the fifth or sixth year. More recently, the term has been used by students of child development as inclusive of the entire period from birth to the eruption of the sixth year molars. With the tendency to the extension of the school life of the child into the earlier years through kindergarten and the newer nursery school, the meaning of the term is becoming even more complicated and indefinite. From the standpoint of child hygiene activities, we usually mean the period from the time the child passes from the care of the infant welfare center until he comes under the health supervision of the public schools, roughly the 2-to-6-year period. This is distinctly a classification upon an administrative basis.

The growth and development of the child is a continuous process. In the same way that many of the health problems of the child of school age have their origin in the preschool years, so many of the problems of the child from 2 to 6 years date back to infancy and even prenatal life. While from an administrative standpoint it may be necessary to consider periods of development, the fact that these are arbitrary and have no existence in an anatomical or physiological sense must be kept clearly in mind.

* Read before the Child Hygiene Section of the American Public Health Association at the Fifty-fourth Annual Meeting at St. Louis, Mo., October 21, 1925.